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 Subject: Material for Telephonic Interview Re: United States Application No.

10/561,254

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Message:

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: 10/561,254
Applicant(s): Hiroshi SEKINE and Makoto NAGASAWA
For: UNIVERSAL JOINT
Confirmation No.: 6492
Customer No.: 26116
Docket No.: 18733/00210
Filed: December 19, 2005
International Application No.: PCT/JP2004/007901
International Filing Date: June 1, 2004
Group Art Unit: 3682
Examiner: James Pilkington

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Transmitted
via
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Dear Sir:

COMMUNICATION TO EXAMINER
TO SUPPORT INTERVIEW

This document is submitted to the Examiner for further discussion as requested during phone interview of November 18, 2008.

Proposed amendments to the claims begin on page 2.

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Remarks begin on page 5.

Presented below, for the purposes of discussion, are proposed claim amendments and a proposed new claim.

1. (Currently Amended) A universal joint, comprising:
 - an input shaft;
 - a pair of yoke arms provided for said input shaft;
 - an output shaft;
 - a pair of yoke arms provided for said output shaft;
 - a cross member having four spider arms, ~~each crossing another~~ configured in a cross pattern;
 - two bearings provided between the tip parts of two of said four spider arms, which are disposed oppositely to each other and two yoke arms of said input shaft; and
 - two bearings provided between the tip parts of the ~~rest~~ other two of said four spider arms, which are disposed oppositely to each other and two yoke arms of said output shaft,
 - wherein said universal joint further includes a resistance applying mechanism that generates the maximum resistance load in an oscillating movement of each of said two spider arms when axes of said two spider arms are included in a plane that includes the axes of both of said input and output shafts.
2. (Original) A universal joint according to claim 1,
 - wherein said resistance applying mechanism is configured so that at least one of said bearings has a resistance load that varies in accordance with an oscillating angle.
3. (Original) A universal joint according to claim 2,

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wherein said bearing used as said resistance applying mechanism is formed with a substantially oval yoke hole formed in said yoke arm and a substantially oval tip part of said spider arm.

4. (Original) A universal joint according to claim 3,

wherein a bearing cup is press-fit in said substantially oval yoke hole formed in said yoke arm and a plurality of needles are provided between the inner surface of this bearing cup and said substantially oval tip part of said spider arm.

5. (Currently Amended) A universal joint according to claim 1,

wherein said resistance applying mechanism ~~is configured by~~ includes a cam surface formed at an end surface of said spider arm ~~and an engaging projection provided in said yoke arm and coming in contact with said cam surface.~~

6. (Currently Amended) A universal joint according to claim 5,

wherein a bearing ~~cup~~ cup is press-fit in a circular yoke hole formed in said yoke arm and ~~a plurality of needles are provided between the inner surface of said bearing cup and a circular tip part of said spider arm, and said engaging projection is formed at the bottom of said bearing cup~~ said bearing cup includes an engaging projection for coming in contact with said cam surface.

7. (Original) A universal joint according to any of claims 1 to 6,

wherein said resistance applying mechanism is provided at either of said input shaft side or output shaft side.

8. (Original) A universal joint according to any of claims 1 to 6,

wherein said resistance applying mechanism is provided at both of said input shaft and output shaft sides.

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9. (Currently Amended) A steering device for vehicle, wherein the universal joint according to any of claims 1 to 6 is provided between a steering column and a steering mechanism ~~at the side of the~~ vehicle body.
10. (Previously Presented) A universal joint assembly for vehicle, including two universal joints configured according to any of claims 1 to 6 and an intermediate shaft:
wherein both of said two universal joints have crossing angles that are substantially equal; and
said intermediate shaft is connected to the output shaft of one of said universal joints and the input shaft of the other.
11. (Currently Amended) A steering device for vehicle, wherein the universal joint according to claim 7 is provided between a steering column and a steering mechanism ~~at the side of the~~ vehicle body.
12. (Currently Amended) A steering device for vehicle, wherein the universal joint according to claim 8 is provided between a steering column and a steering mechanism ~~at the side of the~~ vehicle body.
13. (Previously Presented) A universal joint assembly for vehicle according to claim 10, wherein said resistance applying mechanism for at least one of said two universal joints is provided at either of said input shaft side or output shaft side.
14. (Previously Presented) A universal joint assembly for vehicle according to claim 10, wherein said resistance applying mechanism for at least one of said two universal joints is provided at both of said input shaft and output shaft sides.
15. (New) A universal joint according to claim 6,

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wherein said bearing cup includes a plurality of needles provided between the inner surface of said bearing cup and a circular tip part of said spider arm, and said engaging projection is formed at the bottom of said bearing cup.

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REMARKS

Objections to the Drawings

The indication, in the Office Action, that the Examiner has objections under 37 C.F.R. 11.83(a) to the drawings filed on December 19, 2005, is noted. A number of amendments have been made to the claims. In light of these amendments, examiner's objections to the drawings (Office Action, Par. 1) are considered to be moot.

Claim Objections

The examiner objected to claims 1 and 6 because of informalities. Claims 1 and 6 have been amended as suggested by the examiner. These changes do not introduce any new matter. Accordingly, it is respectfully requested that the objections to informalities in claims 1 and 6 (Office Action, Par. 2) be reconsidered and withdrawn.

35 U.S.C. § 112 Rejections

By this response, claims 5 and 6 have been amended and new claim 15 has been added. To address the examiner's comments, the limitation of an "engaging projection provided in said yoke arm . . ." has been removed from claim 5 and such limitation was added to claim 6 as part of the bearing cup.

These limitations are supported by the specification. For example, page 15 reads, in part, "the resistance applying mechanism is configured by a cam surface 76 and an engaging projection 75." 15:11-13. Additional examples of support can be found on pages 15 and 16 (15:11-16:4) and in Figures 14-16. As a result, the rejection of claims 5 and 6 under the first paragraph of 35 U.S.C. § 112 as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention (Office Action, Par. 4), is

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considered to be moot. Accordingly, it is respectfully requested that the rejection of claims 5 and 6 under the first paragraph of 35 U.S.C. § 112 be reconsidered and withdrawn.

Applicant has amended claims 9, 11, and 12. The claim language subject to the objection, "a steering mechanism at the side of vehicle body", has been amended to "a steering mechanism of the vehicle". The amendments clarify a limitation in claims 9, 11, and 12 wherein the universal joint is located between a steering column (on the driver side of the universal joint(s)) and a vehicle steering mechanism such as a rack-pinion arrangement (on the other side of the universal joint(s)).

Accordingly, it is respectfully requested that the rejection of claims 9, 11, and 12 under the second paragraph of 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention (Office Action, Par. 6), be reconsidered and withdrawn.

35 U.S.C. § 102(b) Rejection

The rejection of claims 1, 2, and 5-8 under 35 U.S.C. § 102(b) as being anticipated by Myers (Office Action, Par. 8), is respectfully traversed based on the following.

Claim 1, as currently amended, recites:

A universal joint, comprising:

- an input shaft;
- a pair of yoke arms provided for said input shaft;
- an output shaft;
- a pair of yoke arms provided for said output shaft;
- a cross member having four spider arms, configured in a cross pattern;
- two bearings provided between the tip parts of two of said four spider arms, which are disposed oppositely to each other and two yoke arms of said input shaft; and
- two bearings provided between the tip parts of the other two of said four spider arms, which are disposed oppositely to each other and two yoke arms of said output shaft,

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wherein said universal joint further includes a resistance applying mechanism that generates the maximum resistance load in an oscillating movement of each of said two spider arms when axes of said two spider arms are included in a plane that includes the axes of both of said input and output shafts.

(emphasis added).

Thus, claim 1 specifically requires a universal joint including a "resistance applying mechanism that generates the maximum resistance load in an oscillating movement of each of said two spider arms when axes of said two spider arms are included in a plane that includes the axes of both of said input and output shafts."

In order to anticipate claim 1, Myers must disclose every limitation of the claim. As shown below, Myers cannot anticipate claim 1 because it does not disclose every limitation of the claim.

Myers discloses a thrust washer for absorbing the radially directed thrust loads caused by a certain amount of radial movement or play between a universal joint's components which result from "manufacturing tolerances associated with the dimensions of the bearing cups 20, the turnnions 12, yokes and fastening devices." (Myers, 5:23-30). Myers explains that the preloading force generated by the thrust washer is important to have only "during the initial balancing process of the drive-shafts," and that once this balancing process is complete, the thrust washer may no longer be needed and should be allowed to wear away. (Myers, 7:33-47). The Myers reference does not disclose a resistance applying mechanism that generates the maximum resistance load in an oscillating movement of each of two spider arms when the axes of said two spider arms are included in a plane that includes the axes of both of said input and output shafts ("Resistance Applying Mechanism"). In addition, the preloading force described in the Myers reference changes as the thrust washer deforms or is worn away, (Myers, 5:39-42), not in accordance with an oscillating angle. Therefore, Myers fails to disclose all the limitations of claim 1 and cannot anticipate this claim.

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Claims 2 and 5-8 depend from claim 1 and thus include every limitation of claim 1. Therefore, Myers cannot anticipate claims 2 and 5-8 due at least to their dependence from claim 1.

Accordingly, it is respectfully requested that the rejection of claims 1, 2, and 5-8 under 35 U.S.C. § 102(b) as being anticipated by Myers, be reconsidered and withdrawn.

35 U.S.C. § 103(a) Rejections

The rejection of claims 3 and 4 under 35 U.S.C. § 103(a), as being unpatentable over Myers in view of McElwain (Office Action, Par. 10), is respectfully traversed based on the following.

To support a *prima facie* case for obviousness, the combination of Myers and McElwain, singly or in combination, must show or suggest every limitation in claims 3 and 4. MPEP § 2143.03. Claims 3 and 4 depend from, and therefore include all the limitations of claim 1 including the Resistance Applying Mechanism limitation. The examiner contends that the combination of Myers and McElwain discloses all the limitations in claims 3 and 4. However, as discussed above, Myers does not disclose the Resistance Applying Mechanism limitation. McElwain also fails to disclose this limitation. Thus, although there are additional distinctions between the inventions of these claims and the combination of Myers and McElwain, the failure of this combination to disclose the Resistance Applying Mechanism is by itself sufficient to demonstrate that this combination cannot render claims 3 and 4 obvious.

Accordingly, it is respectfully requested that the rejection of claims 3 and 4 under 35 U.S.C. § 103(a) as being unpatentable over Myers in view of McElwain, be reconsidered and withdrawn.

The rejection of claims 9-14 under 35 U.S.C. § 103(a), as being unpatentable over Myers in view of Moriyama (Office Action, Par. 11), is respectfully traversed based on the following.

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To render the instant claims obvious, the combination of Myers and Moriyama, singly or in combination, must show or suggest every limitation. Claims 9-14 depend from, and therefore include all the limitations of claim 1 including the Resistance Applying Mechanism limitation. The examiner contends that the combination of Myers and Moriyama discloses all the limitations in claims 9-14. However, as discussed above, Myers does not disclose the Resistance Applying Mechanism limitation. Moriyama also fails to disclose this limitation. Thus, although there are additional distinctions between the inventions of claims 9-14 and the combination of Myers and Moriyama, the failure of this combination to disclose the Resistance Applying Mechanism is by itself sufficient to demonstrate that this combination cannot render claims 9-14 obvious.

Accordingly, it is respectfully requested that the rejection of claims 9-14 under 35 U.S.C. § 103(a) as being unpatentable over Myers in view of Moriyama, be reconsidered and withdrawn.

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CONCLUSION

In view of the foregoing amendments and remarks, this application is considered to be in condition for allowance, and an early reconsideration and a Notice of Allowance are respectfully requested.

Respectfully submitted,

By: _____


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